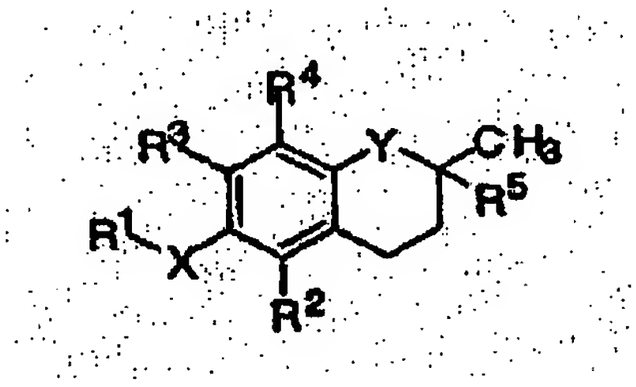
Replacement Claim Amendment

1. (Currently amended) A method for the treatment of a cell proliferative disease comprising administering to an animal a pharmacologically effective dose of a compound having a structural formula



wherein X is oxygen, nitrogen or sulfur;

Y is oxygen, NH or NCH_3 ~~or NR^6~~;

R^1 is $-(CH_2)_{1-5}CO_2H$, $-(CH_2)_7CO_2H$, $-CH_2CONH_2$, $-CH_2CO_2CH_3$, $-CH_2CON(CH_2CO_2H)_2$, $-(CH_2)_2OH$, $-(CH_2)_3NH_3Cl$, or $-(CH_2)_2OSO_3NHEt_3$ ~~R^7; C_{1-4}alkylene-O-C_{1-4}alkyl, C_{1-10}alkylene-CO-SH, C_{1-4}alkylene-CO-S(C_{1-4}alkyl), C_{1-4}alkylene-CS-NH_2, saccharide, alkoxy-linked saccharide, C_{1-4}alkylene-CO-$NH_{(2-n)}$(C_{1-4}alkyl)$_n$ wherein n is 2 or 1, C_{1-4}alkylene-SO_2-O(C_{1-4}alkyl), C_{1-4}alkylene-OSO_2-O(C_{1-4}alkyl), C_{1-4}alkylene-OP(O-C_{1-4}alkyl)$_3$, or C_{1-10}alkylene-CN; or~~

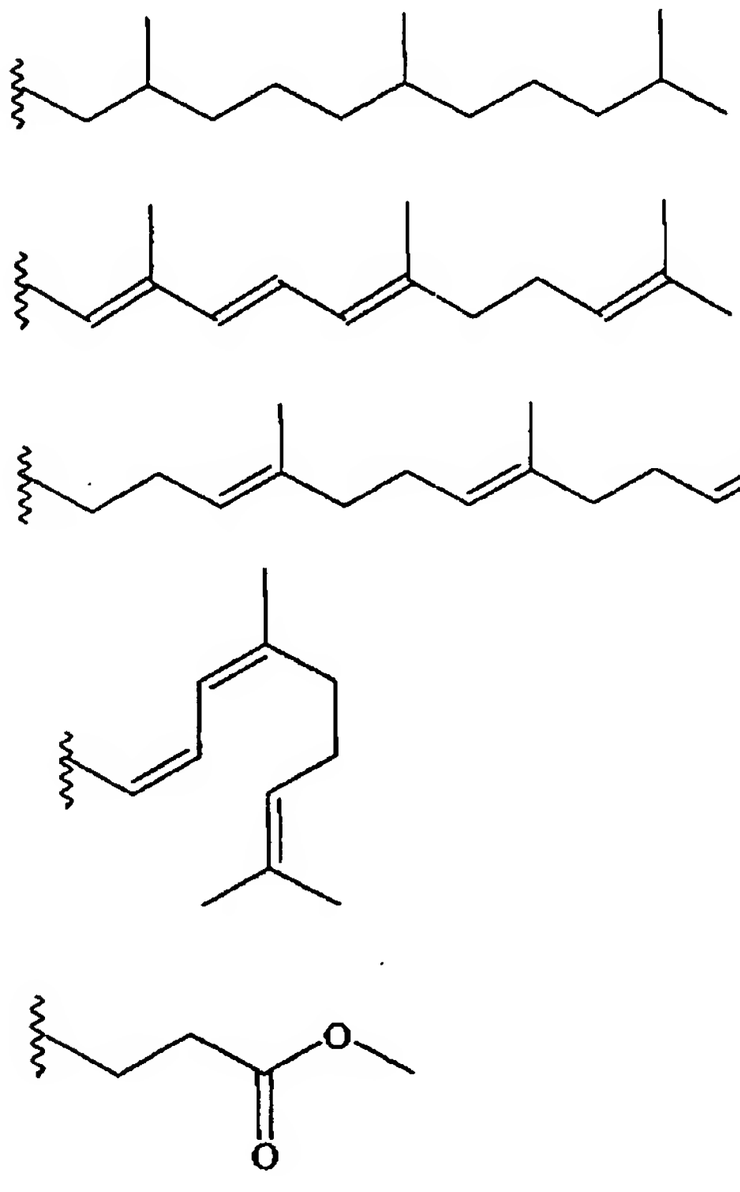
~~X and R^1 jointly symbolize N=NR^9~~;

R^2, R^3 and R^4 are independently –H or $-CH_3$ ~~hydrogen, C_{1-4}alkyl, $CH_2(C_6H_4)C_{1-4}$alkylene-COOH), C_{1-4}alkylene-COO-$CH_2(C_6H_5)$, C_{1-4}alkylene-CO-NH-$CH_2(C_6H_5)$, saccharide, C_{1-4}alkylene-C-$NH_{(2-n)}$(C_{1-4}alkyl)$_n$ wherein n is 2 or 1~~;

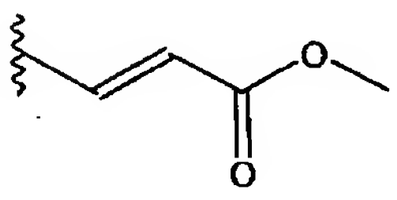
~~R^4 is C_{1-4}alkyl, $CH_2(C_6H_4)C_{1-4}$alkylene-COOH) $CH_2(C_6H_4)C_{1-4}$alkyl-COOH, C_{1-4}alkylene~~alkyl~~-COO-$CH_2(C_6H_5)$, C_{1-4}alkylene~~alkyl~~-CO-NH-$CH_2(C_6H_5)$, saccharide,~~

~~C_{1-4}alkylene-CO-$NH_{(2-n)}$(C_{1-4}alkyl)$_n$ wherein n is 2 or 1;~~

R^5 is phytyl, $-C_{17}H_{35}$ (unbranched), $-C_{13}H_{27}$ (unbranched), $-C_7H_{15}$ (unbranched), $-CH_3$, $-CO_2H$,



or



;

with the proviso that R^1 can not be $-(CH_2)_{2-4}CO_2H$ nor $-(CH_2)_2OH$ when R^2, R^3, R^4 are each $-CH_3$, X and Y are each oxygen and R^5 is phytyl, or a pharmacuetical composition thereof

~~is methyl or R^8;~~

~~R^6 is hydrogen or C_{1-4}alkyl;~~

~~R^7 is C_{1-10}alkylene COOH, C_{1-4}alkylene $CONH_2$, C_{1-4}alkylene COO C_{1-4}alkyl, C_{1-4}alkylene $CON(C_{1-4}alkylene\ COOH)_2$, C_{1-4}alkylene OH, C_{1-4}alkylene NH_3 halo or C_{1-4}alkylene $OSO_2NH(C_{1-4}alkyl)$; and~~

~~R^8 is C_{7-17}alkyl, COOH, C_{7-17} olefinic group containing 3 to 5 ethylenic bonds, C=C COO C_{1-4}alkyl, or C_{1-4}alkylene COO C_{1-4} alkyl; or a pharmaceutical composition thereof;~~

~~wherein when X and Y are O;~~

~~R^1 is R^7;~~

~~R^2, R^3 are independently hydrogen or C_{1-4}alkyl;~~

~~R^4 is C_{1-4}alkyl; and~~

~~R^5 is R^8;~~

~~with the proviso that R^7 can not be C_{2-4}alkylene COOH nor C_2alkylene OH when R^2, R^3, R^4 are each methyl and R^8 is a C_{16} alkyl~~.

2. (Previously presented) The method of claim 1, wherein said compound is selected from the group consisting of 2,5,7,8-tetramethyl-(2R-(4R,8R,12-trimethyltridecyl)chroman-6-yloxy)acetic acid, 2,5,7,8-tetramethyl-2R-(4R,8R,12-trimethyltridecyl)chroman-6-yloxy) hexanoic acid, 2,5,7,8-tetramethyl-2R-(4R,8R,12-trimethyltridecyl)chroman-6-yloxy) octanoic acid, 2,5,8-trimethyl-(2R-(4R,8R,12-trimethyltridecyl)chroman-6-yloxy)acetic acid, 2,7,8-trimethyl-(2R-(4R,8R,12-trimethyltridecyl)chroman-6-yloxy)acetic acid, 2,8-dimethyl-(2R-(4R,8R,12-trimethyltridecyl) chroman-6-yloxy) acetic acid, 2,5,7,8-tetramethyl-2R-(4R,8R,12-trimethyltridecyl)chroman-6-yloxy) acetamide, methyl 2,5,7,8-tetramethyl-2R-(4R,8R,12-trimethyltridecyl) chroman-6-yloxy) acetate, 2-(N,N-(carboxymethyl)-2(2,5,7,8-tetramethyl-(2R-(4R,8R,12-trimethyltridecyl)chroman-6-yloxy) acetic acid, 2,5,7,8-tetramethyl-(2RS-(4RS,8RS,12-trimethyltridecyl)chroman-6-yloxy)acetic acid, 2,5,7,8-tetramethyl-(2R-(carboxy)chroman-6-yloxy))acetic acid, 2,5,7,8-tetramethyl-2R-(2RS,6RS,10-

trimethylundecyl)chroman-6-yloxy)acetic acid, 2,5,7,8,-tetramethyl-2R-(2,6,10-trimethyl-1,3,5,9 E:Z decatetraen)chroman-6-yloxy)acetic acid, 3-(2,5,7,8-tetramethyl-(2R-(4R,8,12-trimethyltridecyl)chroman-6-yloxy)propyl-1-ammonium chloride, 2-(2,5,7,8-tetramethyl-(2R-(4R,8,12-trimethyltridecyl) chroman-6-yloxy)triethylammonium sulfate, 2,5,7,8-tetramethyl-(2R-(heptyl)chroman-6-yloxy)acetic acid, 2,5,7,8,-tetramethyl-(2R-(tridecyl)chroman-6-yloxy) acetic acid, 2,5,7,8,-tetramethyl-(2R-(heptadecyl)chroman-6-yloxy) acetic acid, 2,5,7,8,-tetramethyl-2R-(4,8,-dimethyl-1,3,7 E:Z nonotrien)chroman-6-yloxy) acetic acid, (R)-2[(2,5,7,8-tetramethyl-2-(3 propene methyl ester)chroman-6-yloxy]acetic acid, 2,5,7,8-tetramethyl-(2R-(methylpropionate)chroman-6-yloxy)acetic acid, 1-aza-α-tocopherol-6-yloxyl-acetic acid, 1-aza-α-tocopherol-6-yloxyl-methyl acetate, 1-aza-N-methyl-α-tocopherol-6-yloxyl-methyl acetate, and 1-aza-N-methyl-α-tocopherol-6-yloxyl-acetic acid.

3. (Previously presented) The method of claim 1, wherein said compound exhibits an anti-proliferative effect comprising apoptosis, DNA synthesis arrest, cell cycle arrest, or cellular differentiation.

4. (Previously presented) The method of claim 1, wherein said animal is a human.

5. (Previously presented) The method of claim 1, wherein said composition is administered in a dose of from about 1 mg/kg to about 60 mg/kg.

6. (Previously presented) The method of claim 1, wherein administration of said composition is selected from the group consisting of oral, topical, intraocular, intranasal, parenteral, intravenous, intramuscular, or subcutaneous.

7. (Previously presented) The method of claim 1, wherein said cell proliferative disease is a neoplastic disease, a non-neoplastic disease or a non-neoplastic disorder.

8. (Previously presented) The method of claim 7, wherein said neoplastic disease is selected from the group consisting of ovarian cancer, cervical cancer, endometrial cancer, bladder cancer, lung cancer, breast cancer, testicular cancer, prostate cancer, gliomas, fibrosarcomas, retinoblastomas, melanomas, soft tissue sarcomas, ostersarcomas, leukemias, colon cancer, carcinoma of the kidney, pancreatic cancer, basal cell carcinoma, and squamous

cell carcinoma.

9. (Withdrawn, previously presented) The method of claim 7, wherein said non-neoplastic disease is selected from the group consisting of psoriasis, benign proliferative skin diseases, ichthyosis, papilloma, restinosis, scleroderma, hemangioma, a viral disease, and an autoimmune disease.

10. (Withdrawn, previously presented) The method of claim 9, wherein said autoimmune disease is selected from the group consisting of autoimmune thyroiditis, multiple sclerosis, myasthenia gravis, systemic lupus erythematosus, dermatitis herpetiformis, celiac disease, and rheumatoid arthritis.

11. (Withdrawn, previously presented) The method of claim 7, wherein said non-neoplastic disorder is a viral disorder or an autoimmune disorder.

12. (Withdrawn, previously presented) The method of claim 11, wherein said viral disorder is Human Immunodeficiency Virus.

13. (Withdrawn, previously presented) The method of claim 11, wherein said autoimmune disorder is selected from the group consisting of the inflammatory process involved in cardiovascular plaque formation, ultraviolet radiation induced skin damage and a disorder involving an immune component.

14. (Currently amended) A method for the treatment of a cell proliferative disease comprising administering to an animal a pharmacologically effective dose of 6-(2,4-dinitrophenylazo)-2,5,7,8-tetramethyltridecyl))-1,2,3,4-tetrahydroquinoline, 2,5,7,8-tetramethyl-(2R-(4R,8R,12-trimethyltridecyl)chroman-3-ene-6-yloxy) acetic Acid or 6-(2,5,7,8-tetramethyl-(2R-(4R,8,12-trimethyltridecyl)chroman) acetic acid.

15. (Previously presented) The method of claim 14, wherein said compound exhibits an anti-proliferative effect comprising apoptosis, DNA synthesis arrest, cell cycle arrest, or cellular differentiation.

16. (Previously presented) The method of claim 14, wherein said animal is a human.

17. (Previously presented) The method of claim 14, wherein said composition is administered in a dose of from about 1 mg/kg to about 60 mg/kg.

18. (Previously presented) The method of claim 14, wherein administration of said composition is selected from the group consisting of oral, topical, intraocular, intranasal, parenteral, intravenous, intramuscular, or subcutaneous.

19. (Previously presented) The method of claim 14, wherein said cell proliferative disease is a neoplastic disease, a non-neoplastic disease or a non-neoplastic disorder.

20. (Withdrawn, previously presented) The method of claim 19, wherein said neoplastic disease is selected from the group consisting of ovarian cancer, cervical cancer, endometrial cancer, bladder cancer, lung cancer, breast cancer, testicular cancer, prostate cancer, gliomas, fibrosarcomas, retinoblastomas, melanomas, soft tissue sarcomas, ostersarcomas, leukemias, colon cancer, carcinoma of the kidney, pancreatic cancer, basal cell carcinoma, and squamous cell carcinoma.

21. (Withdrawn, previously presented) The method of claim 19, wherein said non-neoplastic disease is selected from the group consisting of psoriasis, benign proliferative skin diseases, ichthyosis, papilloma, restinosis, scleroderma, hemangioma, a viral disease, and an autoimmune disease.

22. (Withdrawn, previously presented) The method of claim 21, wherein said autoimmune disease is selected from the group consisting of autoimmune thyroiditis, multiple sclerosis, myasthenia gravis, systemic lupus erythematosus, dermatitis herpetiformis, celiac disease, and rheumatoid arthritis.

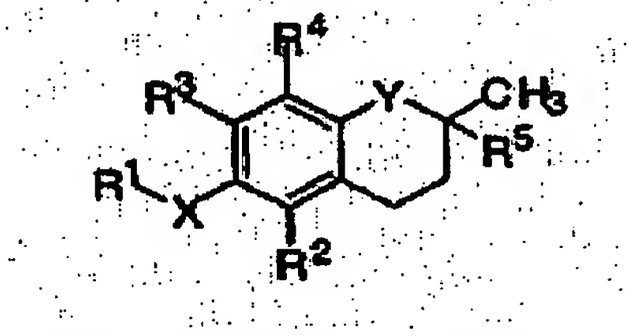
23. (Withdrawn, previously presented) The method of claim 19, wherein said non-neoplastic disorder is a viral disorder or an autoimmune disorder.

24. (Withdrawn, previously presented) The method of claim 23, wherein said viral disorder is Human Immunodeficiency Virus.

25. (Withdrawn, previously presented) The method of claim 23, wherein said autoimmune

disorder is selected from the group consisting of the inflammatory process involved in cardiovascular plaque formation, ultraviolet radiation induced skin damage and disorders involving an immune component.

26. (Currently amended) A method of inducing apoptosis of a cell, comprising the step of contacting said cell with a pharmacologically effective dose of a compound having a structural formula



wherein X is oxygen, nitrogen or sulfur;

Y is oxygen, NH or NCH_3 ~~or NR^6~~;

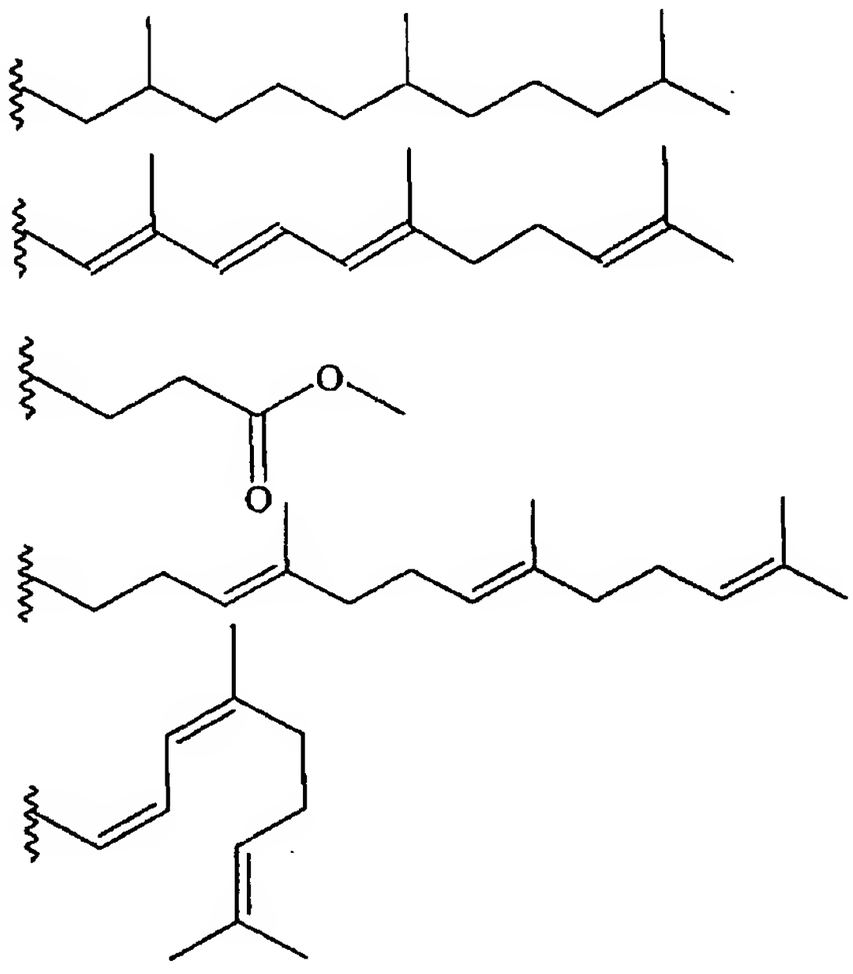
R^1 is $-(CH_2)_{1-5}CO_2H$, $-(CH_2)_7CO_2H$, $-CH_2CONH_2$, $-CH_2CO_2CH_3$, $-CH_2CON(CH_2CO_2H)_2$, $-(CH_2)_2OH$, $-(CH_2)_3NH_3Cl$, or $-(CH_2)_2OSO_3NHEt_3$ ~~R^7, C_{1-4}alkylene-O-C_{1-4}alkyl, C_{1-10}alkylene-CO-SH, C_{1-4}alkylene-CO-S(C_{1-4}alkyl), C_{1-4}alkylene-CS-NH_2, saccharide, alkoxy-linked saccharide, C_{1-4}alkylene-CO-$NH_{(2-n)}$(C_{1-4}alkyl)$_n$ wherein n is 2 or 1, C_{1-4}alkylene-SO_2-O(C_{1-4}alkyl), C_{1-4}alkylene-OSO_2-O(C_{1-4}alkyl), C_{1-4}alkylene-OP(O-C_{1-4}alkyl)$_3$, or C_{1-10}alkylene-CN; or~~

~~X and R^1 jointly symbolize N=NR^9~~;

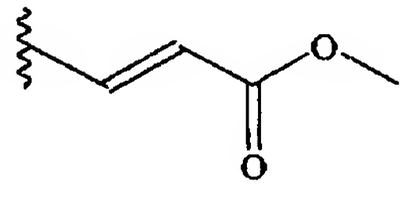
R^2, R^3 and R^4 are independently ~~hydrogen,~~ $-H$ or $-CH_3$ ~~C_{1-4}alkyl, $CH_2(C_6H_4)C_{1-4}$alkylene-COOH), C_{1-4}alkylene-COO-$CH_2(C_6H_5)$, C_{1-4}alkylene-CO-NH-$CH_2(C_6H_5)$, saccharide, C_{1-4}alkylene-C-$NH_{(2-n)}$(C_{1-4}alkyl)$_n$ wherein n is 2 or 1~~;

~~R^4 is C_{1-4}alkyl, $CH_2(C_6H_4)C_{1-4}$alkylene-COOH)~~ $CH_2(C_6H_4)C_{1-4}$ ~~alkyl-COOH, C_{1-4}alkylene~~alkyl ~~-COO-$CH_2(C_6H_5)$, C_{1-4}alkylene~~alkyl ~~-CO-NH-$CH_2(C_6H_5)$, saccharide, C_{1-4}alkylene-CO-$NH_{(2-n)}$(C_{1-4}alkyl)$_n$ wherein n is 2 or 1~~;

R^5 is phytyl, $-C_{17}H_{35}$ (unbranched), $-C_{13}H_{27}$ (unbranched), $-C_7H_{15}$ (unbranched), $-CH_3$, $-CO_2H$,



or



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with the proviso that R^1 can not be $-(CH_2)_{2-4}CO_2H$ nor $-(CH_2)_2OH$ when R^2, R^3, R^4 are each $-CH_3$, X and Y are each oxygen and R^5 is phytyl, or a pharmacuetical composition thereof

~~is methyl or R^8;~~

~~R^6 is hydrogen or C_{1-4}alkyl;~~

~~R^7 is C_{1-10}alkylene-COOH, C_{1-4}alkylene-$CONH_2$, C_{1-4}alkylene-COO-C_{1-4}alkyl, C_{1-4}alkylene-CON(C_{1-4}alkylene-COOH)$_2$, C_{1-4}alkylene-OH, C_{1-4}alkylene-NH_3-halo or~~

~~C_{1-4}alkylene-$OSO_2NH(C_{1-4}$alkyl); and~~

~~R^8 is C_{7-17}alkyl, COOH, C_{7-17} olefinic group containing 3 to 5 ethylenic bonds, C=C-COO-C_{1-4}alkyl, or C_{1-4}alkylene-COO-C_{1-4} alkyl; or a pharmaceutical composition thereof;~~

~~wherein when X and Y are O;~~

~~R^1 is R^7;~~

~~R^2, R^3 are independently hydrogen or C_{1-4}alkyl;~~

~~R^4 is C_{1-4}alkyl; and~~

~~R^5 is R^8;~~

~~with the proviso that R^7 can not be C_{2-4}alkylene-COOH nor C_2alkylene-OH when R^2, R^3, R^4 are each methyl and R^8 is a C_{16} alkyl~~.

27. (Previously presented) The method of claim 26, wherein said compound is selected from the group consisting of 2,5,7,8-tetramethyl-(2R-(4R,8R,12-trimethyltridecyl)chroman-6-yloxy)acetic acid, 2,5,7,8-tetramethyl-2R-(4R,8R,12-trimethyltridecyl)chroman-6-yloxy)hexanoic acid, 2,5,7,8-tetramethyl-2R-(4R,8R,12-trimethyltridecyl)chroman-6-yloxy) octanoic acid, 2,5,8-trimethyl-(2R-(4R,8R,12-trimethyltridecyl)chroman-6-yloxy)acetic acid, 2,7,8-trimethyl-(2R-(4R,8R,12-trimethyltridecyl)chroman-6-yloxy)acetic acid, 2,8-dimethyl-(2R-(4R,8R,12-trimethyltridecyl) chroman-6-yloxy) acetic acid, 2,5,7,8-tetramethyl-2R-(4R,8R,12-trimethyltridecyl)chroman-6-yloxy) acetamide, methyl 2,5,7,8-tetramethyl-2R-(4R,8R,12-trimethyltridecyl) chroman-6-yloxy) acetate, 2-(N,N-(carboxymethyl)-2(2,5,7,8-tetramethyl-(2R-(4R,8R,12-trimethyltridecyl) chroman-6-yloxy) acetic acid, 2,5,7,8-tetramethyl-(2RS-(4RS,8RS,12-trimethyltridecyl)chroman-6-yloxy)acetic acid, 2,5,7,8-tetramethyl-(2R-

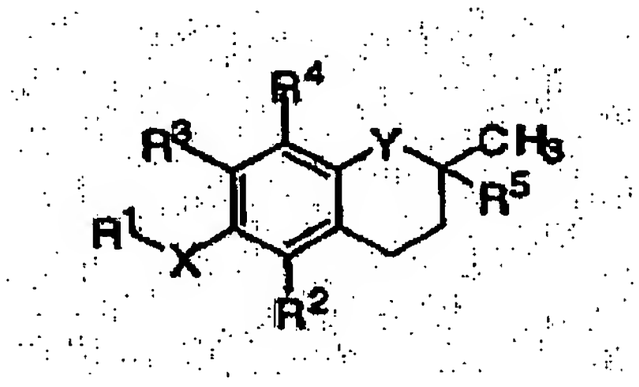
(carboxy)chroman-6-yloxy))acetic acid, 2,5,7,8-tetramethyl-2R-(2RS,6RS,10-trimethylundecyl)chroman-6-yloxy)acetic acid, 2,5,7,8,-tetramethyl-2R-(2,6,10-trimethyl-1,3,5,9 E:Z decatetraen)chroman-6-yloxy)acetic acid, 3-(2,5,7,8-tetramethyl-(2R-(4R,8,12-trimethyltridecyl)chroman-6-yloxy)propyl-1-ammonium chloride, 2-(2,5,7,8-tetramethyl-(2R-(4R,8,12-trimethyltridecyl) chroman-6-yloxy)triethylammonium sulfate, 2,5,7,8-tetramethyl-(2R-(heptyl)chroman-6-yloxy)acetic acid, 2,5,7,8,-tetramethyl-(2R-(tridecyl)chroman-6-yloxy) acetic acid, 2,5,7,8,-tetramethyl-(2R-(heptadecyl)chroman-6-yloxy) acetic acid, 2,5,7,8,-tetramethyl-2R-(4,8,-dimethyl-1,3,7 E:Z nonotrien)chroman-6-yloxy) acetic acid, (R)-2[(2,5,7,8-tetramethyl-2-(3 propene methyl ester)chroman-6-yloxy]acetic acid, 2,5,7,8-tetramethyl-(2R-(methyl propionate)chroman-6-yloxy)acetic acid, 1-aza-α-tocopherol-6-yloxyl-acetic acid, 1-aza-α-tocopherol-6-yloxyl-methyl acetate, 1-aza-N-methyl-α-tocopherol-6-yloxyl-methyl acetate, and 1-aza-N-methyl-α-tocopherol-6-yloxyl-acetic acid.

28. (Previously presented) The method of claim 26, wherein said method is useful in the treatment of a cell proliferative disease.

29. (Currently amended) A method of inducing apoptosis of a cell, comprising the step of contacting said cell with a pharmacologically effective dose of 6-(2,4-dinitrophenylazo)-2,5,7,8-tetramethyltridecyl))-1,2,3,4-tetrahydroquinoline, 2,5,7,8-tetramethyl-(2R-(4R,8R,12-trimethyltridecyl) chroman-3-ene-6-yloxy) acetic Acid or 6-(2,5,7,8-tetramethyl-(2R-(4R,8,12-trimethyltridecyl)chroman) acetic acid.

30. (Previously presented) The method of claim 29, wherein said method is useful in the treatment of a cell proliferative disease.

31. (New) The method for of claim 1, wherein the compound has a structural formula



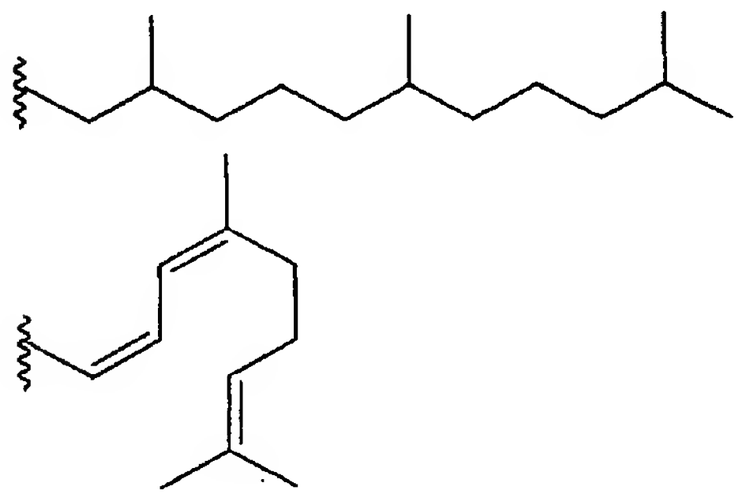
wherein X is oxygen;

Y is oxygen, NH or NCH_3;

R^1 is $-(CH_2)_{1-3}CO_2H$, $-CH_2CON(CH_2CO_2H)_2$, $-(CH_2)_3NH_3Cl$, or $-(CH_2)_2OSO_3NHEt_3$;

R^2, R^3 and R^4 are independently –H or $–CH_3$;

R^5 is phytyl, $-C_{17}H_{35}$ (unbranched),



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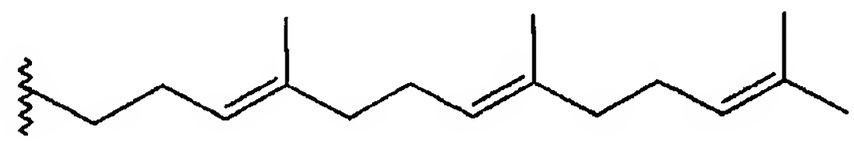

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with the proviso that R^1 can not be $–(CH_2)_{2-3}CO_2H$ when R^2, R^3, R^4 are each $–CH_3$, Y is each oxygen and R^5 is phytyl, or a pharmaceutical composition thereof.

32. (New) The method of claim 31, wherein Y is oxygen in the structural formula for the

compound.

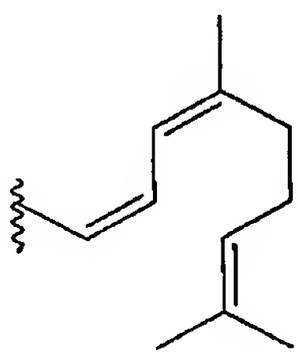
33. (New) The method of claim 31, wherein Y is NH in the structural formula for the compound.

34. (New) The method of claim 33, wherein the compound is 1-aza-α-tocopherol-6-yloxyl-acetic acid.

35. (New) The method of claim 31, wherein Y is NCH_3 in the structural formula for the compound.

36. (New) The method of claim 35, wherein the compound is 1-aza-N-methyl-α-tocopherol-6-yloxyl-acetic acid.

37. (New) The method of claim 31, wherein R^5 in the structural formula for the compound is:

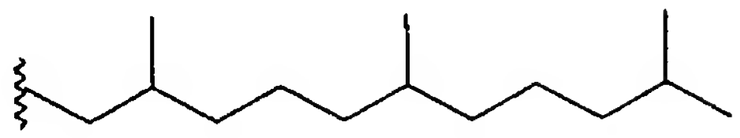


38. (New) The method of claim 37, wherein the compound is 2,5,7,8,-tetramethyl-2R-(4,8,-dimethyl-1,3,7 E:Z nonotrien)chroman-6-yloxy) acetic acid.

39. (New) The method of claim 31, wherein R^5 in the structural formula for the compound is $-C_{17}H_{35}$ (unbranched).

40. (New) The method of claim 39, wherein the compound is 2,5,7,8,-tetramethyl-(2R-(heptadecyl)chroman-6-yloxy) acetic acid.

41. (New) The method of claim 31, wherein R^5 in the structural formula for the compound is:



42. (New) The method of claim 41, wherein the compound is 2,5,7,8-tetramethyl-2R-(2RS,6RS,10-trimethylundecyl)chroman-6-yloxy)acetic acid.

43. (New) The method of claim 31, wherein R^4 is $-CH_3$ in the structural formula for the compound.

44. (New) The method of claim 31, wherein R^3 is –H in the structural formula for the compound.

45. (New) The method of claim 44, wherein the compound is 2,5,8-trimethyl-(2R-(4R,8R,12-trimethyltridecyl)chroman-6-yloxy)acetic acid.

46. (New) The method of claim 44, wherein the compound is 2,8-dimethyl-(2R-(4R,8R,12-trimethyltridecyl) chroman-6-yloxy) acetic acid.

47. (New) The method of claim 31, wherein R^2 is –H in the structural formula for the compound.

48. (New) The method of claim 47, wherein the compound is 2,7,8-trimethyl-(2R-(4R,8R,12-trimethyltridecyl)chroman-6-yloxy)acetic acid.

49. (New) The method of claim 31, wherein, R^1 is CH_2CO_2H in the structural formula for the compound.

50. (New) The method of claim 49, wherein the compound is 2,5,7,8-tetramethyl-(2R-(4R,8R,12-trimethyltridecyl)chroman-6-yloxy)acetic acid.

51. (New) The method of claim 49, wherein the compound is 2,5,7,8-tetramethyl-(2RS-(4RS,8RS,12-trimethyltridecyl)chroman-6-yloxy)acetic acid.

52. (New) The method of claim 31, wherein, R^1 is $-CH_2CON(CH_2CO_2H)_2$ in the structural

formula for the compound.

53. (New) The method of claim 52, wherein the compound is 2-(N,N-(carboxymethyl)-2(2,5,7,8-tetramethyl-(2R-(4R,8R,12-trimethyltridecyl) chroman-6-yloxy) acetic acid.

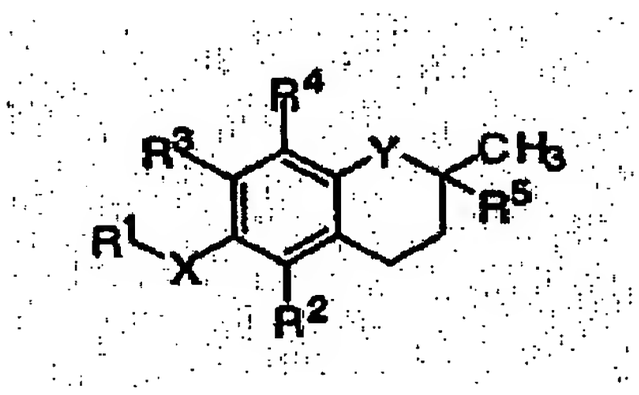
54. (New) The method of claim 31, wherein, R^1 is $-(CH_2)_3NH_3Cl$ in the structural formula for the compound.

55. (New) The method of claim 54, wherein the compound is 3-(2,5,7,8-tetramethyl-(2R-(4R,8,12-trimethyltridecyl)chroman-6-yloxy)propyl-1-ammonium chloride.

56. (New) The method of claim 31, wherein R^1 is $-(CH_2)_2OSO_3NHEt_3$ in the structural formula for the compound.

57. (New) The method of claim 56, wherein the compound is 2-(2,5,7,8-tetramethyl-(2R-(4R,8,12-trimethyltridecyl) chroman-6-yloxy)triethylammonium sulfate.

58. (New) The method for of claim 25, wherein the compound has a structural formula



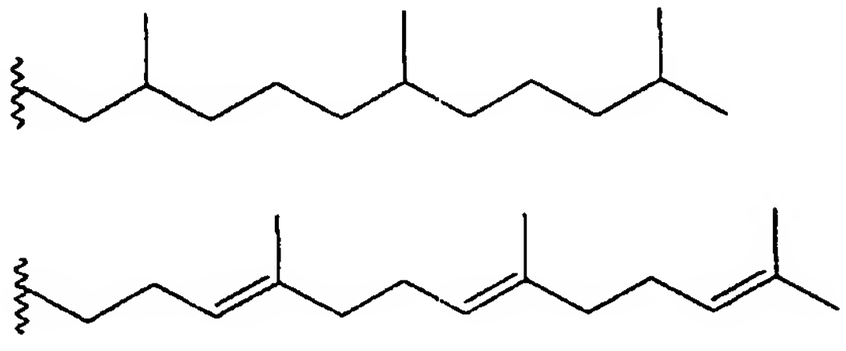
wherein X is oxygen;

Y is oxygen, NH or NCH_3;

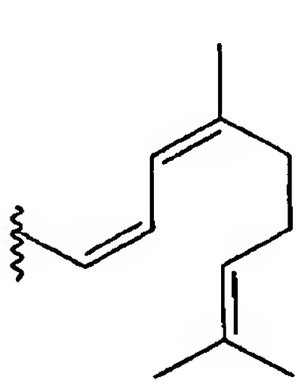
R^1 is $-(CH_2)_{1-3}CO_2H$, $-CH_2CON(CH_2CO_2H)_2$, $-(CH_2)_3NH_3Cl$, or $-(CH_2)_2OSO_3NHEt_3$;

R^2, R^3 and R^4 are independently –H or $–CH_3$;

R^5 is phytyl, $-C_{17}H_{35}$ (unbranched),



or



;

with the proviso that R^1 can not be $-(CH_2)_{2-3}CO_2H$ when R^2, R^3, R^4 are each $-CH_3$, Y is each oxygen and R^5 is phytyl, or a pharmaceutical composition thereof.

59. (New) The method of claim 58, wherein Y is oxygen in the structural formula for the compound.

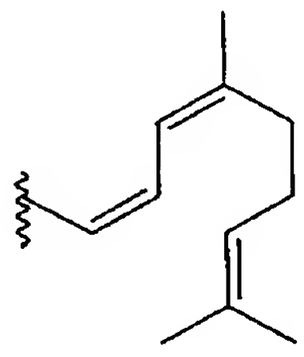
60. (New) The method of claim 58, wherein Y is NH in the structural formula for the compound.

61. (New) The method of claim 60, wherein the compound is 1-aza-α-tocopherol-6-yloxyl-acetic acid.

62. (New) The method of claim 58, wherein Y is NCH_3 in the structural formula for the compound.

63. (New) The method of claim 62, wherein the compound is 1-aza-N-methyl-α-tocopherol-6-yloxyl-acetic acid.

64. (New) The method of claim 58, wherein R^5 in the structural formula for the compound is:

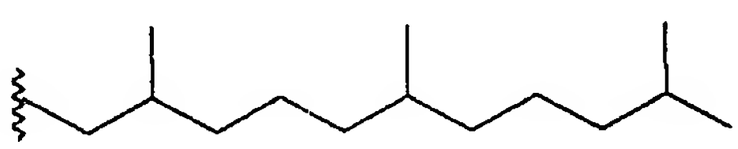


65. (New) The method of claim 64, wherein the compound is 2,5,7,8,-tetramethyl-2R-(4,8,-dimethyl-1,3,7 E:Z nonotrien)chroman-6-yloxy) acetic acid.

66. (New) The method of claim 58, wherein R^5 in the structural formula for the compound is $-C_{17}H_{35}$ (unbranched).

67. (New) The method of claim 66, wherein the compound is 2,5,7,8,-tetramethyl-(2R-(heptadecyl)chroman-6-yloxy) acetic acid.

68. (New) The method of claim 58, wherein R^5 in the structural formula for the compound is:



69. (New) The method of claim 68, wherein the compound is 2,5,7,8-tetramethyl-2R-(2RS,6RS,10-trimethylundecyl)chroman-6-yloxy)acetic acid.

70. (New) The method of claim 58, wherein R^4 is $-CH_3$ in the structural formula for the compound.

71. (New) The method of claim 58, wherein R^3 is –H in the structural formula for the compound.

72. (New) The method of claim 71, wherein the compound is 2,5,8-trimethyl-(2R-(4R,8R,12-

trimethyltridecyl)chroman-6-yloxy)acetic acid.

73. (New) The method of claim 71, wherein the compound is 2,8-dimethyl-(2R-(4R,8R,12-trimethyltridecyl) chroman-6-yloxy) acetic acid.

74. (New) The method of claim 58, wherein R^2 is –H in the structural formula for the compound.

75. (New) The method of claim 74, wherein the compound is 2,7,8-trimethyl-(2R-(4R,8R,12-trimethyltridecyl)chroman-6-yloxy)acetic acid.

76. (New) The method of claim 58, wherein, R^1 is CH_2CO_2H in the structural formula for the compound.

77. (New) The method of claim 76, wherein the compound is 2,5,7,8-tetramethyl-(2R-(4R,8R,12-trimethyltridecyl)chroman-6-yloxy)acetic acid.

78. (New) The method of claim 76, wherein the compound is 2,5,7,8-tetramethyl-(2RS-(4RS,8RS,12-trimethyltridecyl)chroman-6-yloxy)acetic acid.

79. (New) The method of claim 58, wherein, R^1 is $-CH_2CON(CH_2CO_2H)_2$ in the structural formula for the compound.

80. (New) The method of claim 79, wherein the compound is 2-(N,N-(carboxymethyl)-2(2,5,7,8-tetramethyl-(2R-(4R,8R,12-trimethyltridecyl) chroman-6-yloxy) acetic acid.

81. (New) The method of claim 58, wherein, R^1 is $-(CH_2)_3NH_3Cl$ in the structural formula for the compound.

82. (New) The method of claim 81, wherein the compound is 3-(2,5,7,8-tetramethyl-(2R-(4R,8,12-trimethyltridecyl)chroman-6-yloxy)propyl-1-ammonium chloride.

83. (New) The method of claim 58, wherein R^1 is $-(CH_2)_2OSO_3NHEt_3$ in the structural formula for the compound.

84. (New) The method of claim 83, wherein the compound is 2-(2,5,7,8-tetramethyl-(2R-

(4R,8,12-trimethyltridecyl) chroman-6-yloxy)triethylammonium sulfate.